



General information

Wellbore name	25/2-4
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	LILLE-FRIGG
Discovery	25/2-4 Lille-Frigg
Well name	25/2-4
Seismic location	LINE 059588 SP.2858
Production licence	026
Drilling operator	Elf Petroleum Norge AS
Drill permit	129-L
Drilling facility	NEPTUNE 7
Drilling days	160
Entered date	14.05.1975
Completed date	20.10.1975
Release date	20.10.1977
Publication date	29.06.2004
Purpose - planned	WILDCAT
Reentry	NO
Content	GAS/CONDENSATE
Discovery wellbore	YES
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	HUGIN FM
Kelly bushing elevation [m]	24.0
Water depth [m]	113.0
Total depth (MD) [m RKB]	4360.0
Bottom hole temperature [°C]	144
Oldest penetrated age	LATE TRIASSIC
Oldest penetrated formation	SMITH BANK FM
Geodetic datum	ED50
NS degrees	59° 58' 44.09" N
EW degrees	2° 22' 58.88" E
NS UTM [m]	6649378.84
EW UTM [m]	465563.12
UTM zone	31
NPDID wellbore	356



Wellbore history

**General**

Well 25/2-4 was drilled in the north west corner of block 25/2. It lies on the eastern flank of the Viking basin in the Viking Graben and to the east of the Frigg Field and Frigg Kitchen. The main targets was the Jurassic with a mapped seismic structure of 30 ms vertical closure and 30 square km acreage spreading on the Shell block 30/11. Well 25/2-4 was located on the west flank near the top of the structure. Agreement with Shell management was signed for a bottom hole contribution with obligation for the operator to reach the Triassic red shales or to set TD at 3360 m.

The well is Reference Well for the Drake Formation.

Operations and results

Exploration well 25/2-4 was spudded with the semi-submersible installation Neptune 7 on 14 may 1975 and drilled to TD at 4384 m in the Triassic Smith Bank Formation. The well was drilled water based with salt/gel/Flosal/seawater down to 733 m and with FCL/LC mud from 733 m to TD. At 3375 m the well kicked due to an under balanced hydrostatic mud pressure.

The well penetrated Danian, Paleocene and Eoceneá sandstone sequences (Frigg Formation, Intra Balder Formation Sandstones, Hermod and Ty formations). All these sands were water wet without shows. In the Late Cretaceous limestones were found fairly well developed overlying a thick shaly and marly sequence with some more limestone levels, particularly in the Campanian and Turonian. The latter limestones contained significant shows, but a production test proved tight formation. The Kimmerian unconformity was penetrated at 3632 m with 8 m Draupne shale. In the Jurassic two reservoir sandstone sequences were encountered: the Vestland Group and the Statfjord Formation. The Vestland sequence was first interpreted as oil and gas bearing from 3640 m to 3708 m (Hugin Formation) with a probable gas/oil contact 3660 m and an oil/water contact between 3704 m to 3708 m. Net pay in the 25/2-4 Hugin reservoir was estimated around 40 m with porosity from logs averaging 25% and water saturation lower than 25%. The Statfjord sandstones had similar reservoir properties, but were water wet. Due to high pressure the hydrocarbon zone in Hugin Formation was not production tested, in stead fifteen FIT samples were taken, of which five were taken in the "gas zone" and 11 in the "oil zone". Four of the tests were unsuccessful, the remaining samples recovered oil and gas but PVT analyses indicated that the fluids were not fully representative of the formation fluid. After a well test in a later well, 25/2-12 A, it became clear that the reservoir fluid was actually gas with high condensate content. Logs in 25/2-12 confirmed the hydrocarbon/water contact found in 25/2-4 (3678m MSL).

Shows were recorded as follows: At 2750 m gas index and formation pressure increased significantly and remained high down to 3710 m. Peaks of gas were recorded when entering limestone stringers throughout the Late Cretaceous and at the top of the Jurassic sandstones. Direct fluorescence and cuts were observed over the interval 2900 m to 3877 m on limestones and sandstones.

Three cores were cut in the Hugin Formation and three in the Sleipner Formation, 81.75 m in total. In addition to the FIT samples in the Hugin Formation one FIT was taken in the Tryggvason Formation (3374 m: mud filtrate and trace gas) and one in the Statfjord Formation (4116 m: mud filtrate only).

Testing

Campanian limestones were tested over the interval 2902m to 2913 m. No significant flow was recorded even after acid treatment. Only 3.2 m of mud mixed with water and gas were recovered by reverse circulation. No production test was conducted on the Jurassic oil column because rig equipment was inadequate for the reservoir pressures encountered.

**Cuttings at the Norwegian Offshore Directorate**

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
210.00	4360.00

Cuttings available for sampling?	NO
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Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	3650.0	3659.0	[m]
2	3659.0	3676.0	[m]
3	3677.0	3695.0	[m]
4	3817.0	3833.8	[m]
5	3835.0	3845.0	[m]
6	3852.0	3863.0	[m]

Total core sample length [m]	81.8
Cores available for sampling?	YES

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
2580.0	[m]	DC	OD
2600.0	[m]	DC	OD
2620.0	[m]	DC	OD
2640.0	[m]	DC	OD
2660.0	[m]	DC	OD
2680.0	[m]	DC	OD
2700.0	[m]	DC	OD
2720.0	[m]	DC	OD
2740.0	[m]	DC	OD
2760.0	[m]	DC	OD
2780.0	[m]	DC	OD
2800.0	[m]	DC	OD
2820.0	[m]	DC	OD
2840.0	[m]	DC	OD
2860.0	[m]	DC	OD



2880.0	[m]	DC	OD
2900.0	[m]	DC	OD
2920.0	[m]	DC	OD
2940.0	[m]	DC	OD
2960.0	[m]	DC	OD
2980.0	[m]	DC	OD
3020.0	[m]	DC	OD
3040.0	[m]	DC	OD
3060.0	[m]	DC	OD
3080.0	[m]	DC	OD
3100.0	[m]	DC	OD
3120.0	[m]	DC	OD
3140.0	[m]	DC	OD
3160.0	[m]	DC	OD
3180.0	[m]	DC	OD
3200.0	[m]	DC	OD
3220.0	[m]	DC	OD
3235.0	[m]	DC	OD
3255.0	[m]	DC	OD
3275.0	[m]	DC	OD
3295.0	[m]	DC	OD
3315.0	[m]	DC	OD
3335.0	[m]	DC	OD
3355.0	[m]	DC	OD
3380.0	[m]	DC	OD
3400.0	[m]	DC	OD
3420.0	[m]	DC	OD
3440.0	[m]	DC	OD
3460.0	[m]	DC	OD
3485.0	[m]	DC	OD
3500.0	[m]	DC	OD
3520.0	[m]	DC	OD
3540.0	[m]	DC	OD
3560.0	[m]	DC	OD
3585.0	[m]	DC	OD
3600.0	[m]	DC	OD
3620.0	[m]	DC	OD

Lithostratigraphy



Top depth [mMD RKB]	Lithostrat. unit
137	NORDLAND GP
427	UTSIRA FM
1025	HORDALAND GP
1077	SKADE FM
1111	NO FORMAL NAME
1213	GRID FM
1250	NO FORMAL NAME
2012	FRIGG FM
2061	NO FORMAL NAME
2098	ROGALAND GP
2098	INTRA BALDER FM SS
2177	BALDER FM
2208	INTRA BALDER FM SS
2223	SELE FM
2250	HERMOD FM
2325	LISTA FM
2400	VÅLE FM
2590	TY FM
2606	VÅLE FM
2617	SHETLAND GP
2617	HARDRÅDE FM
2925	KYRRE FM
3370	TRYGGVASON FM
3632	VIKING GP
3632	DRAUPNE FM
3640	VESTLAND GP
3640	HUGIN FM
3752	SLEIPNER FM
3876	DUNLIN GP
3876	DRAKE FM
3927	COOK FM
3965	AMUNDSEN FM
4084	STATFJORD GP
4261	NO GROUP DEFINED
4261	SMITH BANK FM

Composite logs





Document name	Document format	Document size [MB]
356	pdf	0.39

Geochemical information

Document name	Document format	Document size [MB]
356 1	pdf	3.27

Documents - older Norwegian Offshore Directorate WDSS reports and other related documents

Document name	Document format	Document size [MB]
356 01 WDSS General Information	pdf	2.83

Documents - reported by the production licence (period for duty of secrecy expired)

Document name	Document format	Document size [MB]
356 2 Sedimentogenese du jurassic de la zone centrale	pdf	7.82
356 3 Core measurements porosity vs permeability	pdf	0.17
356 4 Computer processed interpretation	pdf	15.24
356 5 Computer processed interpretation	pdf	2.45
356 6 Completion Report	pdf	2.86

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	2902	2911	0.0

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				





Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0					

Logs

Log type	Log top depth [m]	Log bottom depth [m]
BHC	724	3351
BHC-C	3351	4358
CBL	2800	4253
CBL	2825	3350
CBL	3020	3350
CBL	3250	3725
CBL	4050	4138
CDM	1950	4259
CDM AP	1950	4259
CDM FP	1951	4258
CDM SP	1950	4259
DLL	3550	3903
FDC	2000	2100
FDC	2550	2867
FDC CNL	3351	3909
GR	137	724
IES	724	4361
ML MLL	2859	2949
MLL ML	3351	3913
TEMP	127	724
TEMP	1580	2004
TEMP	3150	3500

Casing and leak-off tests

Casing type	Casing diam. [inch]	Casing depth [m]	Hole diam. [inch]	Hole depth [m]	LOT/FIT mud eqv. [g/cm3]	Formation test type
CONDUCTOR	30	195.0	36	200.0	0.00	LOT
INTERM.	20	723.0	26	733.0	0.00	LOT
INTERM.	13 3/8	2860.0	17 1/2	2870.0	0.00	LOT
INTERM.	9 5/8	3353.0	12 1/4	3374.0	0.00	LOT



OPEN HOLE		4360.0	8 1/2	4360.0	0.00	LOT
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Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
136	1.06	100.0		water based	
700	1.05	100.0		water based	
1437	1.18	60.0	12.0	water based	
2147	1.25	55.0	11.0	water based	
3380	1.91	53.0	18.0	water based	
3640	1.92	60.0		water based	
3915	1.93	54.0	22.0	water based	
4260	1.94	56.0	22.0	water based	
4360	1.77	66.0		water based	

Pressure plots

The pore pressure data is sourced from well logs if no other source is specified. In some wells where pore pressure logs do not exist, information from Drill stem tests and kicks have been used. The data has been reported to the NPD, and further processed and quality controlled by IHS Markit.

Document name	Document format	Document size [MB]
356 Formation pressure (Formasjonstrykk)	pdf	0.22

